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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,894	03/08/2007	David Mainwaring	21854-00075-USI	6101
30678 7590 09/25/2007 CONNOLLY BOVE LODGE & HUTZ LLP 1875 EYE STREET, N.W. SUITE 1100 WASHINGTON, DC 20036			EXAMINER DUNLAP, JONATHAN M	
			ART UNIT 2855	PAPER NUMBER
			MAIL DATE 09/25/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/599,894

Applicant(s)

MAINWARING ET AL.

Examiner

Jonathan Dunlap

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 October 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date October 12, 2006
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Claim Objections

Claims 1 and 3 are objected to because of the following informalities:

Considering **claim 1**, "1x10¹⁵ ions/cm" should be written as --1x10¹⁵ ions/cm²--.

Considering **claim 3**, "composition of the polymer and increase the electrical conductivity" should be rewritten as --composition of the polymer and increasing the electrical conductivity--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Terai et al. (NPL – Properties of carbon films produced from polyimide by high-energy ion irradiation)** in view of **Bureau et al. (U.S. Patent 5,437,195)**.

Considering claim 1, Terai discloses a specimen which consists of a polymer that has been irradiated with less than 1×10^{15} ions/cm² in a portion of its surface (**Abstract; Introduction; Experimental; Page 631; Column 1**).

The invention by Terai fails to explicitly disclose that the specimen is used as a strain sensor and that conductive tracks are deposited onto the treated portion to enable the sensor to be connected to an external electric circuit.

3. However, Bureau teaches a polymer strain sensor, which has been irradiated with ions and conductive tracks, are deposited onto the treated portion to enable the sensor to be connected to an external electric circuit (**Figure 1-2; Column 3, lines 23-61**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the polymer specimen irradiated by ions as a strain sensor as taught by Bureau. The motivation for doing so is that by using a polymer strain sensor, the premature fatigue and varying characteristics of temperature that are associated with prior art polymer sensor which have metal layered on top of the polymer can be avoided (**Column 1, lines 24-61**). Furthermore, by irradiating conductive tracks right into the film, the need for additional layers or conductive tracks, i.e. additional metal, which would reintroduce the problems associated with the prior art, is also avoided.

Considering claim 2, Terai discloses that the polymer is a polyimide film (**Introduction**).

Considering claim 3, Terai discloses a method of forming a strain sensor from a polymeric film which includes the steps of:

- Selectively irradiating a surface of the polymer with high energy radiation to change the composition of the polymer (**Abstract**); and
- Increase the electrical conductivity in selected portions of the surface (**Figure 5; Introduction; Experimental; Results and discussion, page 630, paragraph 1**).

Considering claim 4, Terai discloses that the high energy radiation carbonizes the polymer to form conductive particles in the polymer (**Abstract, Introduction**).

Considering claim 5, Terai discloses that high energy ions impinge on a polymer film containing precursor metal compounds, such that decomposition of the precursor leads to nucleation of conducting metal particles (**Introduction; Page 629 (paragraph continued from page 628; Figure 2)**).

Considering claim 6, Terai discloses that the polymer is a polyimide (**Introduction**).

Considering claim 7, Terai fails to disclose that conducting tracks are deposited onto the treated polymer to enable the device to be connected to an external electric circuit.

4. However, Bureau teaches that the conducting tracks are deposited onto the treated polymer to enable the device to be connected to an external electric circuit (**Column 3, lines 35-49**).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit conductive tracks into the treated polymer film as taught by Bureau. The motivation for doing so is that by using a polymer strain sensor, the premature fatigue and varying characteristics of temperature that are associated with prior art polymer sensor which have metal layered on top of the polymer can be avoided (**Column 1, lines 24-61**). Furthermore, by irradiating conductive tracks right into the film, the need for additional layers or conductive tracks, i.e. additional metal, which would reintroduce the problems associated with the prior art, is also avoided.

Considering claim 8, Terai fails to explicitly disclose that a strain sensor is made using the irradiated polymer film.

5. However, Bureau teaches a polymer strain sensor, which has been irradiated with ions (**Figure 1-2; Column 3, lines 23-61**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the polymer specimen irradiated by ions as a strain sensor as taught by Bureau. The motivation for doing so is that by using a polymer strain sensor, the premature fatigue and varying characteristics of temperature that are associated with prior art polymer sensor which have metal layered on top of the polymer can be avoided (**Column 1, lines 24-61**).


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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Dunlap whose telephone number is (571) 270-1335. The examiner can normally be reached on M-F 8-5 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Jonathan Dunlap
Examiner
AU 2855
September 17, 2007


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